# PGNAA Study in Aqueous Solution using $^{241}$Am–Be Neutron Source and HPGe Detector

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A prompt gamma neutron activation analysis (PGNAA) system including an Am–Be neutron source and HPGe detector are used for quantitative analysis of aqueous samples. The different quantity (10 – 1000 g) of sodium chloride (NaCl) has been dissolved in 5L deionized water. The data acquisition time of prompt gamma detection was 1800 s for each sample. The results showed the counts of the prompt gamma rays from chlorine do not increase linearly with its concentration above to 100 g content of NaCl, while the prompt gamma ray counts from 10 - 100 g vary nearly linearly with the concentrations, due to the neutron self- shielding. Minimum detectable concentration has been estimated for chlorine (Cl) at 6110.8 keV prompt gamma peak. The obtained MDC was 781±273 ppm in aqueous solution.

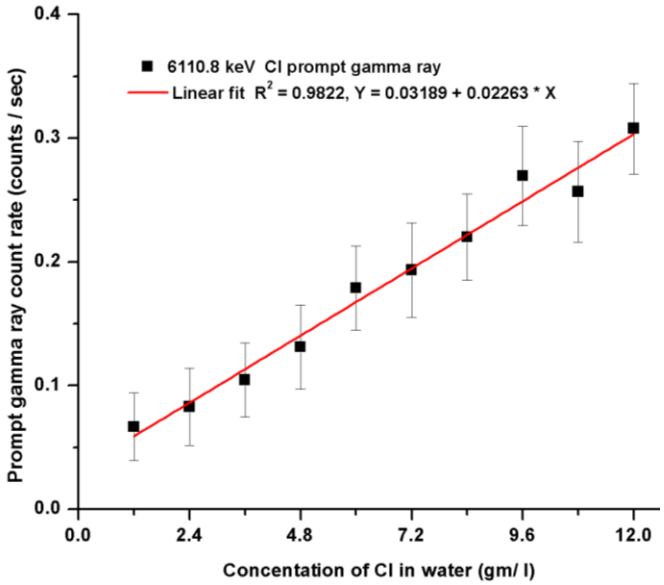


Fig. 1. The measured count rates of 6110.84 keV vs. concentrations of chlorine.

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